Operations

Reported by Bob Miller

ALS operations continued with 21 weekly shifts as follows: 16 user shifts, three accelerator physics shifts, one maintenance shift, and one startup and test shift per week. In addition, we continued to insert one two-day maintenance period per month during 1997. The maintenance period helped keep the time needed for major installation shutdowns to a minimum.

Figure 2-16 shows that the beam reliability (actual/scheduled beam time) during the year was 92.3% overall and 92.1% during user shifts (a total of 6483 hours scheduled for users and 5976 hours delivered). The time-accounting algorithm for the ALS was changed beginning October 1, 1997 so that the two normally scheduled storage ring refills per shift are not included as downtime. This was done, with DOE concurrence, in part to make our reporting more consistent with that of some other comparable facilities. The result is an average increase of about 4% in apparent uptime that will show up fully in next year's statistics but that is not reflected in the data shown for the first three quarters of 1997, which were calculated using the old algorithm.

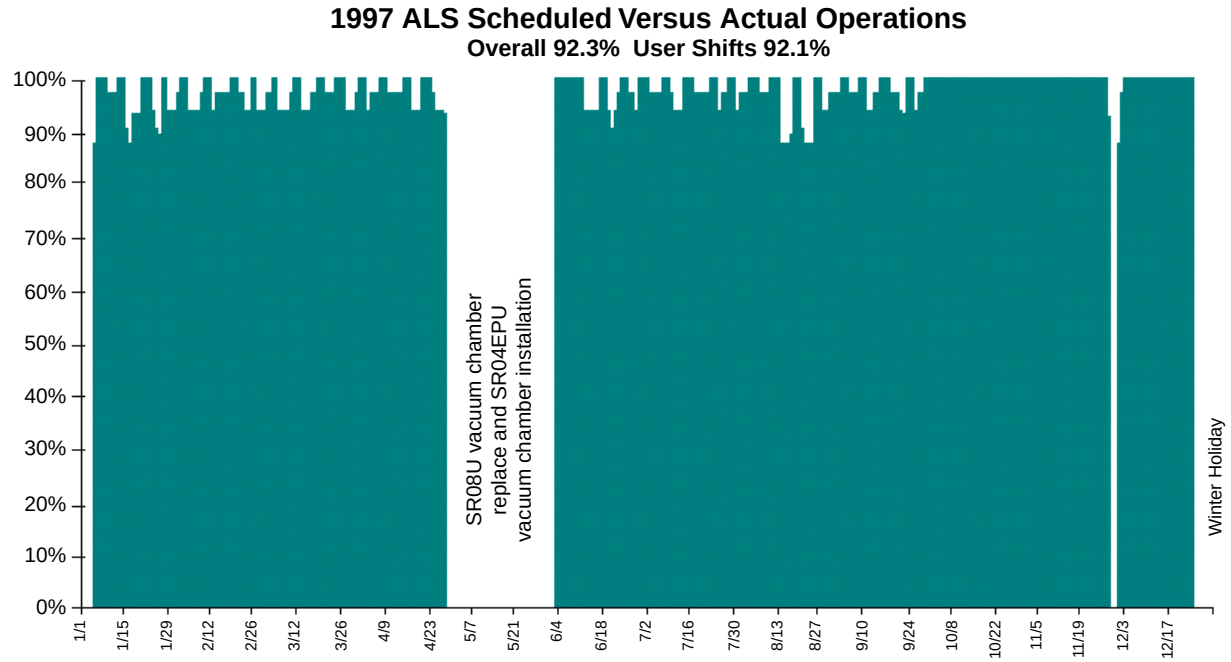

Figure 2-16. ALS scheduled versus actual operations during 1997.

Scheduling for user operations is done at least six months in advance with input from users, the Users' Executive Committee (UEC), and ALS management. Weekly scheduling meetings are held to fine-tune the two-week rolling schedule.

1997 Operations Highlights

User operations fit the general pattern of one-third of the time for 1.5-GeV and two-thirds of the time for 1.9-GeV beam energy. The default multibunch fill pattern is 288 contiguous bunches, which allows a sufficient gap so that a single 20-mA bunch (camshaft) spike can be provided in the gap when requested by users for time-resolved measurements. Special operations included

1.3-GeV multibunch (1 week) and 1.9-GeV two-bunch (4 weeks). There were no major outages during 1997.

Beam current for 1.9-GeV multibunch operation was increased to 400 mA after tests and rf-system tuning to allow increasing the power limit with the existing rf-cavity windows. Beam stability fill-to-fill was improved by the development and implementation of a “one button fill routine” using Matlab, which carries out a set of pre-determined routines, as well as setup at the beginning of each week, to insure that all the critical steps for storage ring refill are carried out exactly the same to maintain fill-to-fill beam-orbit stability.

Storage-ring thermal stability remains good as a result of the work done in 1996. A new 450-ton chiller unit will be installed in 1998 to supply all the chilled water needs for the ALS complex. This will further improve temperature stability of the storage ring by eliminating the need to switch on an additional chiller during warm weather.

The storage ring RF water system was identified as a source of vibration that was observed at the infrared beamline (Beamline 1.4). A team of ALS physicists and mechanical and operations staff, in collaboration with the users, carried out tests to characterize the vibration frequencies, resulting in recommendations to reduce the vibration; the recommendations are being implemented. This work will continue in 1998.